

From J. B. Lamarck's *Système des animaux sans vertèbres* (Paris: Deterville, 1801)

Discours d'ouverture du Cours de Zoologie,
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Extracts

If one considers the diversity of forms, bulks, magnitudes, and characters that nature has given her products, the variety of the organs and faculties with which she has enriched the beings whom she has endowed with life, one cannot help but to admire the infinite resources which she has used to arrive at her end. For it seems that in some way everything that one can imagine actually has a place that all the forms, all the faculties, and all the modes have been exhausted in the formation and composition of that immense number of natural productions which exist. But if one examines with attention the means which she seems to employ for that purpose, one will recognize that their power and fecundity are sufficient to produce all the effects observed.

It seems, as I have already mentioned, that time and favorable circumstance are the two principal means which nature employs to give existence to all of her productions. One knows that time is not limited for her and, consequently, that she always has it at her disposal.

Concerning those circumstances of which she has had need and which she uses again each day to vary her productions—one can say that they are apparently inexhaustible.

The principal circumstances are constituted by the influence of the climate, the variations of atmospheric temperature and surrounding environment, the diversity of locations, the varieties of habits, movements, actions, the means of living, and the ways of self-preservation, defense, and propagation. But as a result of these diverse influences, the faculties become accommodated to each other and strengthen themselves through uses and they become diversified through new habits which have been practiced for a long time. Insensibly the conformation, the firmness, in a word, the nature and state of the parts, as well as the organs, participate in the consequences of all of these influences, retain them, and propagate them through generation.

The bird, which need lures to the water to find the prey that it requires to live, spreads the toes of its feet when it wishes to strike the water and move along the surface. The skin which unites the toes at their base acquires the habit of spreading itself out. Thus in time, the large membrane which unites the toes of the duck, the goose, and others is formed in the way we now see.

...

I am able to look over all the classes, orders, genera, and species of animals which exist and show that the conformation of the individuals and their parts--such as their organs, faculties, etc.--are entirely the result of those circumstances to which the race of each species finds itself subjected by nature.

I will be able to show that it is not the form either of the body or its parts which determines the habits, the manner of life of animals; but, on the contrary, that it is the habits, the manner of life and all the influencing circumstances which have, in time, constituted the form of the body and the parts of animals. With these new forms, now faculties have been acquired; and little by little, nature arrives at the state which we now see to exist.

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Indeed, if one considers first the organization of the most simple animal and rises gradually to the most complex--that is, from the monad, which is, so to speak, a living point, to the mammals and then to man--one finds obviously a nuanced graduation in the composition of the organization of all the animals and in the nature of the results of its organization. This is something one cannot admire too much and which one must endeavor to study, to discern, and to know well.

...

By that nuanced graduation in the complication of organization, I do not mean to speak of the existence of a linear series, one which has regular intervals of species and genera. Such a series does not exist. I speak, rather, of a nearly regularly graduated series within the principal groups, such as the great families. Such a series surely exists in both the animals and vegetables. But in considering the genera and, above all, the species, in many places lateral ramifications are formed, the extremities of which constitute virtually isolated points.

Système des animaux sans vertèbres

"Sur les fossiles"

Extracts

The first results of the study of fossils suggested to many naturalists that the idea embodied in the following proposition was well founded:

That all fossils are the remains of animals or vegetables whose living analogues no longer exist in nature.

They have concluded that the exterior surface of the globe, in whose dry parts and different climates we find fossils, has undergone a universal upheaval, a general catastrophe, the consequence of which was that a multitude of diverse animal and vegetable species perished and were absolutely destroyed.

A universal upheaval--which necessarily disorders everything, confounds and disperses all--is a rather *convenient* means for those naturalists who wish to explain everything and who do not take any trouble to observe and study the course which nature follows in regard to her productions and all that constitute her domain. I have already spoken elsewhere about what one must think concerning this pretended universal upheaval of the globe. I return to these fossils.

. . .

I agree that it is possible for one not to find anywhere among fresh water or marine shells those *which* perfectly resemble those fossil shells of which I will speak. I believe I know the reason. I will indicate it succinctly. I hope that then one will understand that, although many fossil shells are different from all known marine shells, that does not prove that the species of those shells are extinct. It only shows that those species have changed in the course of time and that actually they have forms different from those of individuals whose fossil remains we have found.

Every man observes and has learned enough to know that nothing remains in the same state on the surface of the terrestrial globe. Everything, in time, is subject, more or less suddenly, to diverse mutations, according to the nature of the objects and the circumstances. Elevated places are continually degraded by the alternate action of sun and rain; everything which

breaks away is swept across the lower regions; the beds of rivers, of streams, and of the sea itself are displaced. In a word, everything on the surface of the earth changes its situation, its form, its nature, and appearance..

But if, as I will try to show elsewhere, the diversity of circumstances for living beings leads to a diversity of habits, a different mode of existence, and, consequently, modifications or developments in their organs and in the form of their parts, one must recognize that every living being must insensibly vary in its organization and forms. One must also recognize that all modifications which it manifests in its organization and its forms, by reason of the circumstances which have influenced that being, propagate themselves through generation, and that after a long course of centuries not only will new species, new genera, and new orders have been formed, but each species will have necessarily varied in its organization and forms.

Therefore one should no longer be astonished if among the number of fossils that one finds in all dry parts of the globe and that offers us the remains of all of the animals which have formerly existed--one should not be surprised if one finds so few that are analogous to living beings. If there is, on the contrary, something that should astonish us, it is that we should meet among the numerous extinct fossils bodies that have been living, ones that still have existing analogues which are known to us. That fact, since we are always collecting fossils, must make us suppose that the fossil remains of animals of which we know the living analogues--that these are the fossils which are less ancient. Undoubtedly the species of each of these has not had yet enough time, apparently, to vary some of its forms.

One must, therefore, not look forward to ever finding among the living species the totality of those which one meets in the fossil state. Yet one cannot conclude that no species have really perished or are extinct. It is, without doubt, possible that among the great number of animals there have been some species destroyed by reason of the increase of men in those place which they inhabit. But that conjecture cannot be founded on a consideration of fossils alone: one can say that only when all the habitable parts of the globe will be perfectly known.

Translation
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